Economic Intelligence Report

SUPPLY OF ELECTRIC POWER AND POSSIBLE LEVELS OF INDUSTRIAL OUTPUT IN THE EUROPEAN SATELLITES IN 1965

CIA/RR ER 63-37

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CENTRAL INTELLIGENCE AGENCY

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FOREWORD

This examination of the supply of electric power in the European Satellites* was originally undertaken to assess the adequacy of the planned supply of power to support the level of industrial production planned for 1965. A secondary objective was to examine the role of the new unified Eastern European electric power network that the Satellites expected to use as a means of exchanging electric power between areas of surplus and deficit within the Satellites and for importing small amounts of electric power from the USSR. While research was in progress, however, the situation in the Satellites changed. The over-all plans for industrial growth in some of the Satellites were reduced. Accordingly, actual industrial requirements for electric power in 1965 have been reduced, although no official changes in goals for additions to electric generating capacity, production of electric power, or power transfers have been announced. Moreover, it is now estimated that none of the Satellites will produce a surplus of electric power in 1965 and that the unified Eastern European network will serve only to facilitate local exchanges of power within the Satellites and to import power from the USSR. During the winter of 1962-63, shortages of electric power in the Satellites raised the question of whether the supply of power during the next few years would be adequate to support even the lower levels of industrial output now anticipated. Consequently, this report is not concerned primarily with the planned requirements for power or with the planned supply of power. Instead, estimates have been made of the level of industrial production that could be supported by the supply of electric power that probably will be available in 1965.

* The Satellites discussed in this report include Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Rumania. Albania is not included, because its production and consumption of electric power are insignificant in comparison with the other countries and because it is not connected to the Eastern European electric power network.

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SUPPLY OF ELECTRIC POWER AND POSSIBLE LEVELS OF INDUSTRIAL OUTPUT IN THE EUROPEAN SATELLITES IN 1965*

Summary and Conclusions

Programs for adding electric generating capacity in the European Satellites are running far behind schedule, and production of electric power in 1965 probably will be less than 90 percent of the amount originally specified in long-term plans. As a result of the failure to make planned additions to generating capacity, reserves will remain inadequate and hours of utilization extremely high. In consequence of excessive utilization of over-age equipment, breakdowns and temporary local power shortages will continue to be a problem. Marginal local power shortages also may occur as a result of low water flow or severe freezing conditions similar to those that occurred in the winter of 1962-63. Factors having nothing to do with the availability of power, however, have limited the Satellites to rates of industrial growth that are well below those originally planned. Consequently, the requirements for electric power in 1965 will be less than originally anticipated, and available supplies of power probably will be generally adequate to support any rate of industrial growth that can now be reasonably anticipated.

The supply of electric power in the European Satellites in 1965 probably will be about 170 billion kilowatt-hours (kwh) -- of which net imports will provide about 1.2 billion kwh. Most of the imported power will be obtained from the Western Ukrainian network of the USSR by means of the new unified Eastern European electric power network.

If the relationship between increases in industrial production and in consumption of electric power continues to be about the same as that which prevailed during the past decade, the estimated supply of electric power in 1965 will be sufficient to support the level of industrial output that could be attained by an average annual rate of industrial growth of about 7.5 percent during 1963-65. This rate is similar to previous estimates based on other considerations.

* The estimates and conclusions in this report represent the best judgment of this Office as of 15 November 1963.

I. Generating Capacity

The European Satellites are estimated to have had about 23,100 megawatts (mw) of generating capacity at the end of 1960. Plans called for the addition of about 17,300 mw by the end of 1965. Additions to capacity have been lagging far behind schedule, and the original plans, although not officially abandoned, apparently are no longer considered valid. New targets are being set for years further in the future. It is estimated that actual additions to generating capacity during 1961-65 will be no more than 9,500 mw, less than 55 percent of the planned increase. During 1961 and 1962, net additions to capacity totaled more than 3,600 mw, and nearly 5,900 mw may be added during 1963-65, bringing the total capacity up to about 32,600 mw.* Table 1** shows generating capacity in the individual Satellites at the end of 1960 and compares the estimated probable net additions to generating capacity during 1961-65 with the original plan goals.

Both East Germany and Czechoslovakia have experienced such great difficulty in recent years in manufacturing generators and turbines of 100-mw capacity that the programs for installation of new capacity in these countries have been badly disrupted. Defects in Czechoslovak equipment and delays in shipment have adversely affected installation of new capacity, not only in Czechoslovakia but also in Rumania and Bulgaria, countries that rely heavily on imported Czechoslovak equipment. Installation is progressing somewhat more satisfactorily in Hungary and Poland, which do not depend on unreliable East German and Czechoslovak equipment. About half of the equipment installed in Hungary is produced domestically, and the rest is imported from the USSR. Poland depends heavily on imports from the USSR, France, and the UK.

II. Production

Growth in production of electric power in the European Satellites is being retarded by the delays in installation of new generating capacity. It is probable that production, estimated at 134 billion kwh in 1962, will increase to only about 169 billion kwh in 1965, or 89 percent of the 189 billion kwh originally planned. Approximately 20 percent of the increase in production during 1963-65 will result from increased utilization of equipment in spite of the fact that existing

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* Additions to capacity are net additions and do not include new capacity replacing equipment being retired.

** P. 4, below.

Table 1

European Satellites: Estimated Generating Capacity
1960-65

Megawatts

Country	Yearend 1960 a/	Planned Addition 1961-65 b/	Estimated Net Additions			1965	
			Total b/	1961-62 c/	1963-65 d/	Yearend e/	Average f/
Bulgaria	925	1,300	800	240	540	1,700	1,600
Czechoslovakia	5,662	3,500	1,900	840	1,100	7,600	7,400
East Germany g/	6,957	5,000	2,000	560	1,500	9,000	8,800
Hungary	1,479	700	500	170	350	2,000	1,950
Poland	6,316	4,700	3,400	1,520	1,860	9,700	9,400
Rumania	1,779	2,100	800	320	500	2,600	2,500
Total h/	23,118	17,300	9,500	3,650	5,830	32,600	31,650

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b. Data have been rounded to the nearest 100 megawatts.
c. 1961, 2/; 1962, 3/. Data have been rounded to the nearest 10 megawatts.
d. Based on Satellite press items concerning individual plants, installation of new capacity, types of units planned for installation, and retirement of old capacity. For a discussion of estimated additions to capacity during 1963-65, see Appendix A. Data have been rounded to the nearest 10 megawatts.
e. Capacity at the end of 1960 plus net additions to capacity during 1961-65.
f. Yearend capacity minus half of the estimated net addition to capacity during the year.
g. Capacity figures for East Germany are operable capacity. Figures for other countries are total installed capacity.
h. Because of rounding, components may not add to the totals shown.

equipment is being used at an excessively high rate. The increase in average utilization will be made possible by practically continuous operation of new generating capacity in thermal powerplants.

As shown in Table 2, production of electric power in Poland in 1965 probably will exceed the original plan goal by about 2.5 billion kwh. Even so, it will be below the level that would be reached by continuation of the average annual rate of growth achieved during the 9-year period from 1952 through 1961. Hungarian production will continue to increase at about the rate achieved for the period 1952-61 and will reach approximately the level planned for 1965. Rumania also will continue to increase production at the rate achieved for the period 1952-61 but will fall short of achieving its unrealistic plan goal. Bulgaria, Czechoslovakia, and East Germany will fail to achieve either past rates of increase or plan goals.

Table 2

European Satellites: Estimated Production of Electric Power
1965

Billion Kilowatt-Hours

Country	Estimated a/	Planned b/	Continuation of 1952-61 Trend c/
Bulgaria	9.3	11.2	10
Czechoslovakia	35	39	39
East Germany	51.5	63.3	56
Hungary	11	11.2	11
Poland	48	45.5	50
Rumania	14	18.5	14
Total	168.8	188.7	178

a. Derived by multiplying estimated average capacity (see Table 1) by projected hours of utilization. For a discussion of hours of utilization in each country, see Appendix A.
b. 4/
c. Estimated on the basis of the average annual rate of growth during 1953-61. Because of rounding components may not add to total shown.

III. Imports of Electric Power

Net imports of electric power into the European Satellites in 1965 probably will amount to about 1.2 billion kwh. Hungary plans to be importing 1 billion kwh annually from the USSR by 1965 5/ and apparently will need to do so. The Western Ukrainian network exported about

200 million kwh to Hungary through the Eastern European network in 1962, 6/* and the Dobrotvor Thermal Electric Powerplant in the Western Ukraine is installing 100 mw of capacity in addition to that originally planned in order to help cover the additional requirement. 8/

Bulgaria has planned to import 300 million to 400 million kwh from the Western Ukrainian network in the USSR via Rumania in 1965. 9/ The major suppliers of power to the Western Ukrainian network in 1965 were expected to be the Burshtyn Thermal Electric Powerplant and the Dobrotvor Thermal Electric Powerplant. The Burshtyn plant, however, probably will not be completed by 1965, 10/ and the Dobrotvor plant will be exporting a billion kwh to Hungary in addition to supplying local consumers in the USSR. Consequently, the estimate of imports into Bulgaria from the USSR has been placed at 100 million kwh, well below plan. Net imports of electric power into Bulgaria from Yugoslavia are planned to reach 100 million kwh in 1963, 11/ and it is estimated that they will be at least that amount in 1965.

Other imports of electric power by the European Satellites are expected to be insignificant -- primarily seasonal exchanges with Austria and Yugoslavia and local exchanges between individual Satellites and the USSR. Czechoslovakia planned to import 2 billion kwh from Rumania in 1965, via the USSR, but the Ludus Thermal Electric Powerplant that was to supply the power probably will not be completed by 1965, 12/ and it is unlikely that Rumania will be able to do more than meet its own requirements for power. If Czechoslovakia actually needs to import power in 1965 it probably would have to rely on imports from the USSR, either directly or via Poland. Because of adverse weather conditions that have affected the flow of water to hydroelectric powerplants and because of problems that have delayed getting large new generating units to operate properly, Czechoslovakia has been experiencing difficulties in producing sufficient electric power to support even the recent low rate of industrial growth. These difficulties,

* The linking of the national power networks of the individual Satellites with each other and with the USSR has been in progress since the early 1950's and is now nearing completion. By early 1963, double lines of high voltage capacity (220 kilovolts) connected Poland with East Germany, East Germany with Czechoslovakia, Czechoslovakia with Poland and Hungary, Hungary with the Western Ukrainian network of the USSR, and Poland with the Belorussian network of the USSR. Two other high voltage lines are now under construction -- a line from the uncompleted Ludus Thermal Electric Powerplant in Rumania through the Mukachevo substation in the USSR to Lemesany in eastern Czechoslovakia and a line from Craiova in southern Rumania to Boychinovtsi in Bulgaria. The first of these lines is to be completed in 1963 and the second in 1964 7/ (see the map, Figure 1).

Figure 1

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however, probably will be overcome by 1965, and it seems improbable that Czechoslovakia will require more electric power than it will produce itself. Poland has exchanged small amounts of power with the USSR for years. Until 1959, Polish exports of power to the USSR slightly exceeded imports from the USSR. In that year, however, this exchange began to result in a small net import for Poland. In 1963 a transmission line was erected to supply power from the Berezovo Thermal Powerplant in Belorussia to the Polish network at Bialystok, 13/ and a contract was signed whereby Poland is supposed to receive 120 million kwh in 1963. 14/ It is estimated that Polish consumption requirements and domestic production in 1965 will be approximately in balance, and any imports from the USSR probably will be limited to the traditional exchange. Should Czechoslovak industrial growth and the resulting demand for electric power exceed present expectations, Poland also might import small amounts of power from the USSR to compensate for exports to Czechoslovakia. Like Poland, East Germany and Rumania are expected to produce approximately the amount of power that they will require in 1965, and no significant imports will be necessary. It is estimated, therefore, that net imports into the European Satellites will be limited to the 1 billion kwh to be imported by Hungary and the approximately 200 million kwh to be imported by Bulgaria.

IV. Supply of Power and Level of Industrial Activity

The estimated total supply of electric power in the European Satellites in 1965, as shown in Table 3,* will approximate 170 billion kwh -- production of 168.8 billion kwh and net imports of 1.2 billion kwh. This supply represents an increase of approximately 208 percent above the 55.2 billion kwh apparently consumed in 1952. Consumption of electric power in the European Satellites has been growing more rapidly than industrial output. From 1952 through 1962, each increase of 1 percent in consumption of power was accompanied by an average increase of about 0.83 percent in industrial output.** If the past relationship between increases

* P. 8, below.

** The relationship between growth in consumption of electric power and growth in industrial output was determined by calculation of the regression of the index of industrial output on the index of apparent consumption of electric power for the period 1952-62. (For a graphic presentation, see Figure 2, following p. 8.) The index of industrial production used was a value-added, weighted index as nearly comparable with the index of industrial production prepared by the US Federal Reserve Board as available data will permit. It was based on indexes for the individual Satellites either prepared by, or accepted by, this Office. These indexes cover production in manufacturing, mining, and public utilities.

Table 3

European Satellites: Estimated Production, Net Imports, and Available Supply of Electric Power
1965

Billion Kilowatt-Hours

Country	Production	Net Imports	Available Supply
Bulgaria	9.3	0.2 a/	9.5
Czechoslovakia	35	0	35
East Germany	51.5	0	51.5
Hungary	11	1 b/	12
Poland	48	0	48
Rumania	14	0 c/	14
Total	168.8	1.2	170

a. Net imports of 0.1 billion kilowatt-hours from Yugoslavia and 0.1 billion kilowatt-hours from the USSR via Rumania.
b. From the USSR.
c. Imports of 0.1 billion killowatt-hours from the USSR and exports of 0.1 billion killowatt-hours to Bulgaria.

in consumption of electric power and in industrial output continues, the index of industrial output in 1965 will be about 273 (1952 = 100).* This level of industrial output could be achieved by an average annual increase of about 7.5 percent during the years 1963-65, a rate that is

* An estimate of probable industrial output in 1965 ideally should be based on consideration of many factors other than availability of electric power. Availability of power, however, does afford an adequate basis for making a preliminary estimate of such growth and for checking the validity of estimates derived by other methods. In the past, there has been a high correlation between the rate of increase in consumption of electric power and the rate of increase in industrial growth. This correlation is explained at least partly by the fact that more than 70 percent of the electric power sent to final consumers in the European Satellites is consumed by industry and that other consumers have tended to increase their consumption at about the same rate as consumption by industry. 15/ A further explanation of the high correlation is the fact that both the index of apparent consumption and the index of industrial output are time series and are therefore autocorrelated -- that is, in both series the value of each observation is partly dependent on the value of the observation that immediately preceded it.

Figure 2

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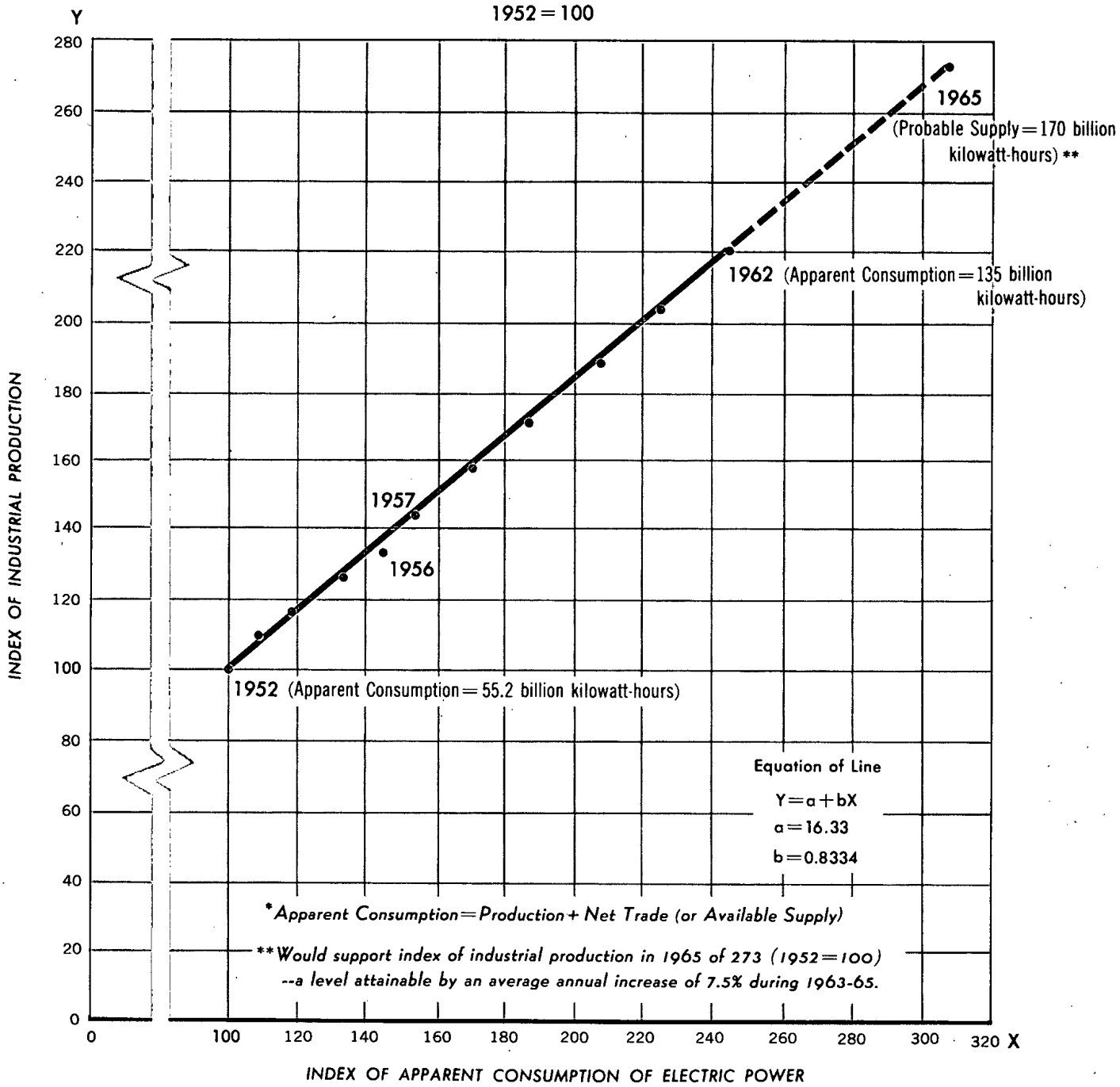
EUROPEAN SATELLITES

RELATIONSHIP OF INDUSTRIAL PRODUCTION TO APPARENT CONSUMPTION* OF ELECTRIC POWER 1952-62 and 1965 Projected



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quite compatible with previous rough estimates based on other considerations. (The average annual increase during the preceding 3 years, 1960-62, was about 8.5 percent.)

Estimates of the levels of industrial output that could be supported in 1965 by the supply of power that probably will be available in the individual Satellites were calculated in basically the same manner as for the Satellites as a whole (see Table 4*). Adjustments were made, however, for evident or anticipated changes in the patterns of consumption of electric power in some of the countries.** The rates of increase in industrial output shown in Table 4 are near the upper limits of the ranges generally believed to be possible. An increase lower than the projection shown is most probable in Czechoslovakia, which currently is experiencing severe economic difficulties and probably will achieve little if any industrial growth in 1963. Should factors other than availability of electric power preclude industrial growth at the rates indicated in Table 4, not all of the estimated supply of power in the Satellites would be needed. Imports might be cut, but more probably hours of utilization would fall below the level now estimated and older generating equipment would be retired or placed in reserve.

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* P. 10, below.

** Possible industrial output in 1965 in Czechoslovakia, East Germany, and Poland was estimated by projection of the relationship between increases in consumption of electric power and in industrial growth established during the period 1952-62. In the case of Bulgaria the estimate was based on an adjustment of the historical relationship to allow for present development of new industries that consume large amounts of electric power. During the period 1959-62, consumption of electric power per unit of industrial output in Bulgaria increased substantially, and plans call for considerable development of power-intensive chemical and metallurgical industries by 1965. 16/ Consequently, the estimate for Bulgaria was based on an adjustment of the relationship between industrial growth and power consumption during the period 1959-62 rather than on the longer historical trend. The estimate for Hungary was based on the relationship established during the period 1958-62 in order to avoid distortions in the pattern of consumption occasioned by the 1956 revolt. In Rumania, consumption of electric power per unit of industrial output apparently was greater during the period 1952-55 than it has been subsequently. Hence the estimate for Rumania was based on the relationship between increases in consumption of power and industrial output during the period 1956-62.

Table 4

European Satellites: Projected Industrial Output a/
1965

Country	1965 Index (1952 = 100)	Average Annual Rate of Increase 1963-65 (Percent)
Bulgaria	396	11.8
Czechoslovakia	260	6.9
East Germany	235	5.3
Hungary	227	7.6
Poland	295	8.5
Rumania	395	12.6
Total	273	7.5

a. Based on estimated supply of electric power.

APPENDIX A

NET ADDITIONS TO ELECTRIC POWER CAPACITY
IN THE EUROPEAN SATELLITES AND HOURS OF UTILIZATION

1. Bulgaria

Production of electric power in Bulgaria will be limited by problems of installing new equipment and by the extent to which equipment can be utilized. The major Bulgarian project for development of new power capacity is the construction of three large thermal powerplants at Maritsa-Iztok, the site of extensive open-pit lignite mines. The equipment for these plants, as well as for smaller Bulgarian powerplants, is being imported from the USSR. Deliveries of equipment have been delayed, and the Bulgarians have rarely met their planned dates of installation. Consequently, it is estimated that net additions to capacity during 1963-65 will be only about 540 mw.

Delays in installing new thermal capacity and droughts that have limited the availability of hydroelectric power have led to increased utilization of operable thermal capacity. In 1962 the average hours of utilization of all installed capacity was about 5,400 hours,* but the operable thermal powerplant capacity was utilized at an average of over 7,500 hours, 17/ a rate that is considered excessive. The predominant share of thermal capacity in the additions to generating capacity in Bulgaria may permit the average utilization of electric powerplants to increase to about 5,800 hours in 1965.

2. Czechoslovakia

Most of the new generating equipment to be added in Czechoslovakia during 1963-65 will be domestically produced units of 100-mw capacity for installation in large thermal powerplants. The first of these units was produced in 1959 and installed in the Tisova Thermal Electric Powerplant in the middle of 1960. Because of serious defects in structure or design, the unit was not commissioned as scheduled in September 1960. 18/ This unit was to have served as the prototype for a series of eighteen 100-mw turbogenerator sets to be installed in 5 thermal powerplants by the end of 1965. 19/ Delays in correcting the defects in the prototype disrupted the entire program for installation of new capacity in Czechoslovakia.**

* Calculated on the basis of production and average generating capacity for the year.

** By early 1963, three 100-mw units had been installed at the Tisova plant and two at the Tusimice plant. Difficulties were still being experienced in getting them to operate properly. 20/

It is estimated therefore, that net additions to operable capacity during 1963-65 will be no more than 1,100 mw.

As a result of the failure to meet annual plans for installation of new capacity in thermal powerplants, the Czechoslovaks possess virtually no reserve capacity and are overworking the operable installed capacity. In 1961 the baseload thermal electric capacity, which was about 70 percent of all thermal electric powerplant capacity, was being operated almost 7,000 hours. 21/ As most of the generating capacity added during 1963-65 will be in large thermal powerplants, the average utilization may increase from 4,500 hours in 1962 to about 4,700 hours in 1965. The continued existence of large amounts of old, inoperable capacity in the country will prevent more intensive use.

3. East Germany

East Germany has planned to meet its increasing demands for electric power during 1963-65 by an ambitious program for installing new generating capacity. This program is encountering serious obstacles as a result of poor planning and defective domestically manufactured turbines and generators. Most of the new capacity to be added during 1963-65 will be installed in thermal powerplants located near sources of brown coal in the southeastern part of the country. The largest of these plants, the Luebbenau Thermal Powerplant, is now under construction and is planned to have in operation 10 turbogenerator units of 100 mw each by the end of 1965. The first of these units, produced at VEB Bergmann-Borsig in East Berlin at the end of 1960, was to have been installed during 1961. The unit was formally installed and commissioned early in 1962, but was soon undergoing extensive repairs. At least four other units of this series were manufactured at Bergmann-Borsig during 1961-62, but none was operable by the beginning of 1963. It has been reported that these 100-mw units were assembled and delivered without adequate preliminary testing and that major flaws in the design were not detected before installation. As these units are to form the principal basis for additional capacity in the electric power system during 1963-65, not only at Luebbenau but also at two other large powerplants (Berzdorf and Vetschau), the failure of the equipment is causing substantial delay in the program for increasing production of electric power in East Germany. 22/ It is estimated that net additions to operable capacity in East Germany during 1963-65 will be no more than 1,500 mw.

There is little reserve capacity within the East German electric power system, and the operable capacity is overworked. During 1952-61 the average utilization of operable capacity was about 5,800 hours. In recent years the utilization of baseload plants has been about 6,500 hours. 23/ As some small increase in utilization probably will occur as a result of the greater share of baseload plants in total production,

it is estimated that utilization of operable capacity in 1965 will be 5,800 to 5,900 hours.

4. Hungary

Most of the additions to generating capacity in Hungary during 1963-65 will be units of Hungarian or Soviet manufacture to be installed in four thermal powerplants. As all of these projects are currently behind schedule, 24/ it is estimated that only about 350 mw of new capacity will be added by 1965.

Average hours of utilization have risen from about 4,300 hours in 1957 to more than 5,300 hours in 1961.* It is estimated that the utilization of powerplants will continue to increase to about 5,600 hours in 1965.

5. Poland

In 1962, Poland added about 1,100 mw of new capacity to its electric power network. 26/ This addition of capacity was considerably larger than any previous annual increment in Poland and was larger than the total additions to capacity in all of the other Satellites in 1962. Most of the new capacity is being installed in large new thermal powerplants, under construction at open-pit brown coal mines. Much of the generating equipment being installed is imported from the USSR, Czechoslovakia, Hungary, France, and the UK. The types and models of equipment selected by Polish officials are proved, reliable machines. Poland serially produces steam turbines and turbogenerators of 125 mw under licensing arrangements with a British firm. The Poles are thus avoiding the serious difficulties encountered by East Germany and Czechoslovakia, which are depending on domestically produced 100-mw units of new and untested design. It is estimated, therefore, that Poland will be able to make total net additions to generating capacity of about 1,860 mw during 1963-65.

As most of the new capacity will be in large, new thermal units, it is estimated that the average utilization of capacity will increase from about 4,800 hours in 1961** to about 5,100 hours in 1965.

6. Rumania

Most of the new capacity to be added in Rumania during 1963-65 will be installed in thermal powerplants utilizing natural gas or fuel oil. Generating units of 50 mw and 150 mw imported from the USSR and units of 100 mw imported from Czechoslovakia will comprise

* Estimated. 25/
** Estimated. 27/

the major portion of new capacity during 1961-65. Soviet deliveries of equipment probably will arrive on or near the scheduled dates, but delivery and installation of Czechoslovak units of 100 mw have been and will continue to be delayed. 28/ It is estimated that about 500 mw of new thermal electric generating equipment will be added in Rumania during 1963-65.

The average hours of utilization of equipment in Rumania have increased fairly steadily since 1954, from about 3,300 hours in that year to more than 4,900 hours in 1962. 29/ It is estimated that the hours of utilization will continue to increase to about 5,600 hours in 1965.

APPENDIX B

STATISTICAL TABLES

Table 5

European Satellites: Electric Power and Industrial Production a/
1952-62 and 1965

Year	Electric Power					Industrial Production Index
	Yearend Capacity (Megawatts)	Production (Million Kilowatt-Hours)	Net Trade (Million Kilowatt-Hours)	Apparent Consumption		
				Million Kilowatt-Hours	Index	
1952	12,315	55,236	10	55,246	100	100
1953	13,055	59,872	160	60,032	109	109
1954	14,670	65,374	375	65,749	119	117
1955	15,941	73,300	168	73,468	133	127
1956	16,955	79,792	118	79,910	145	133
1957	18,171	85,155	5	85,160	154	144
1958	19,786	94,143	60	94,203	170	158
1959	21,558	103,298	131	103,429	187	172
1960	23,118	113,986	200	114,186	207	189
1961	24,907	124,177	104	124,281	225	205
1962	26,768	134,455	495	134,950	244	220
1965 b/	32,600	168,800	1,200	170,000	308	273

a. Excluding Albania. Data in this table are compiled from Tables 6 through 11, pp. 18 through 23, below.
b. Estimated.

Table 6

Bulgaria: Electric Power and Industrial Production a/
1952-62 and 1965

	Electric Power							
				Apparent Consumption			Industrial Production	
Year	Yearend Capacity (Megawatts)	Production (Million Kilowatt-Hours)	Net Trade (Million Kilowatt-Hours)	Million Kilowatt-Hours	Index	Index	Index	Index
1952	329	1,352	27	1,379	100		100	
1953	338	1,557	40	1,597	116		106	
1954	384	1,730	41	1,771	128		115	
1955	432	2,073	33	2,106	153		129	
1956	526	2,393	27	2,420	175		138	
1957	611	2,656	14	2,670	194		153	
1958	719	3,024	16	3,040	220		179	
1959	872	3,869	26	3,895	282	100	205	100
1960	925	4,657	28	4,685	340	120	236	115
1961	1,046	5,407	39	5,446	395	140	257	125
1962	1,165	6,085	63	6,148	446	158	283	138
1965	1,700	9,300	200	9,500	689	244	396	193

a. Production, capacity, and net trade in 1952-61 are from 30/; in 1962, from 31/. Apparent consumption was derived by adding production and net trade. Capacity in 1965 is capacity at the end of 1962 plus the estimated additions to capacity in 1963-65 discussed in Appendix A. Production in 1965 is estimated on the basis of average capacity in 1965 (see Table 1, p. 4, above) multiplied by estimated hours of utilization (see Appendix A). For a discussion of the derivation of the estimate of net trade in 1965, see p. 5, above. Concerning the index of industrial production during 1952-62, see the second footnote on p. 7, above. The index of industrial production shown for 1965 is a projection based on the relationship between increases in consumption of electric power and industrial output during 1959-62 and on the estimated available supply of electric power in 1965.

Table 7

Czechoslovakia: Electric Power and Industrial Production a/
1952-62 and 1965

	Electric Power					
				Apparent Consumption		
Year	Yearend Capacity (Megawatts)	Production (Million Kilowatt-Hours)	Net Trade (Million Kilowatt-Hours)	Million Kilowatt-Hours	Index	Industrial Production Index
1952	3,055	11,634	130	11,764	100	100
1953	3,143	12,363	-27	12,336	105	103
1954	3,457	13,610	-118	13,492	115	108
1955	3,979	15,013	-131	14,882	127	120
1956	4,210	16,591	-284	16,307	139	128
1957	4,467	17,720	-228	17,492	149	142
1958	4,668	19,620	-225	19,395	165	156
1959	5,363	21,884	-249	21,635	184	171
1960	5,662	24,450	-263	24,187	206	186
1961	6,373	26,962	-335	26,627	226	201
1962	6,500	28,732	71	28,803	245	213
1965	7,600	35,000	0	35,000	298	260

a. Production, capacity, and net trade in 1952-61 are from 32/; in 1962, from 33/. Apparent consumption was derived by adding production and net trade. Capacity in 1965 is capacity at the end of 1962 plus the estimated additions to capacity in 1963-65 discussed in Appendix A. Production in 1965 is estimated on the basis of average capacity in 1965 (see Table 1, p. 4, above) multiplied by estimated hours of utilization (see Appendix A). For a discussion of the derivation of the estimate of net trade in 1965, see p. 5, above. Concerning the index of industrial production during 1952-62, see the second footnote on p. 7, above. The index of industrial production shown for 1965 is a projection based on the relationship between increases in consumption of electric power and industrial output during 1952-62 and on the estimated available supply of electric power in 1965.

Table 8

East Germany: Electric Power and Industrial Production a/
1952-62 and 1965

	Electric Power					
				Apparent Consumption		
Year	Yearend Capacity (Megawatts)	Production (Million Kilowatt-Hours)	Net Trade (Million Kilowatt-Hours)	Million Kilowatt-Hours	Index	Industrial Production Index
1952	4,040	23,183	-132	23,051	100	100
1953	4,250	24,247	44	24,291	105	116
1954	4,930	26,044	219	26,263	114	126
1955	5,045	28,695	-8	28,687	124	133
1956	5,370	31,182	-146	31,036	135	140
1957	5,485	32,735	-330	32,405	141	148
1958	5,994	34,874	-294	34,580	150	159
1959	6,400	37,248	-337	36,911	160	175
1960	6,957	40,305	-375	39,930	173	186
1961	7,282	42,515	-372	42,143	183	193
1962	7,516	45,063	-179	44,884	195	201
1965	9,000	51,500	0	51,500	223	235

a. Production, capacity, and net trade in 1952-62 are from 34/. Apparent consumption was derived by adding production and net trade. Capacity in 1965 is capacity at the end of 1962 plus the estimated additions to capacity in 1963-65 discussed in Appendix A. Production in 1965 is estimated on the basis of average capacity in 1965 (see Table 1, p. 4, above) multiplied by estimated hours of utilization (see Appendix A). For a discussion of the derivation of the estimate of net trade in 1965, see p. 5, above. Concerning the index of industrial production during 1952-62, see the second footnote on p. 7, above. The index of industrial production shown for 1965 is a projection based on the relationship between increases in consumption of electric power and industrial output during 1952-62 and on the estimated available supply of electric power in 1965.

Table 9

Hungary: Electric Power and Industrial Production a/
1952-62 and 1965

Year	Electric Power: Yearend Capacity (Megawatts)	Electric Power: Production (Million Kilowatt-Hours)	Electric Power: Net Trade (Million Kilowatt-Hours)	Electric Power: Apparent Consumption: Million Kilowatt-Hours	Electric Power: Apparent Consumption: Index	Industrial Production: Index	Industrial Production: Index	Industrial Production: Index
1952	852	4,197	3	4,200	100		100	
1953	879	4,615	209	4,824	115		105	
1954	959	4,824	289	5,113	122		110	
1955	1,086	5,428	248	5,676	135		118	
1956	1,147	5,201	366	5,567	133		107	
1957	1,269	5,447	305	5,752	137		119	
1958	1,327	6,479	332	6,811	162	100	131	100
1959	1,428	7,093	360	7,453	177	109	140	107
1960	1,479	7,617	536	8,153	194	120	152	116
1961	1,575	8,382	498	8,880	211	130	169	129
1962	1,647	9,118	450	9,568	228	141	182	139
1965	2,000	11,000	1,000	12,000	286	176	227	173

a. Production and net trade in 1952-61 and capacity in 1955, 1957-61 are from 35/; capacity in 1952-54 and 1956 are from 36/; and production, capacity, and net trade in 1962 are from 37/. Apparent consumption was derived by adding production and net trade. Capacity in 1965 is capacity at the end of 1962 plus the estimated additions to capacity in 1963-65 discussed in Appendix A. Production in 1965 is estimated on the basis of average capacity in 1965 (see Table 1, p. 4, above) multiplied by estimated hours of utilization (see Appendix A). For a discussion of the derivation of the estimate of net trade in 1965, see p. 5, above. Concerning the index of industrial production during 1952-62, see the second footnote on p. 7, above. The index of industrial production shown for 1965 is a projection based on the relationship between increases in consumption of electric power and industrial output during 1958-62 and on the estimated available supply of electric power in 1965.

Table 10

Poland: Electric Power and Industrial Production a/
1952-62 and 1965

	Electric Power					
				Apparent Consumption		
Year	Yearend Capacity (Megawatts)	Production (Million Kilowatt-Hours)	Net Trade (Million Kilowatt-Hours)	Million Kilowatt-Hours	Index	Industrial Production Index
1952	3,166	11,984	7	11,991	100	100
1953	3,500	13,679	-66	13,613	114	111
1954	3,829	15,469	-16	15,453	129	120
1955	4,179	17,751	58	17,809	149	131
1956	4,368	19,495	182	19,677	164	140
1957	4,899	21,157	258	21,415	179	152
1958	5,571	23,962	247	24,209	202	163
1959	5,891	26,380	357	26,737	223	176
1960	6,316	29,307	302	29,609	247	194
1961	6,768	32,254	313	32,567	272	213
1962	7,841	35,384	123	35,507	296	231
1965	9,700	48,000	0	48,000	400	295

a. Production, capacity, and net trade in 1952-61 are from 38/; in 1962, from 39/. Apparent consumption was derived by adding production and net trade. Capacity in 1965 is capacity at the end of 1962 plus the estimated additions to capacity in 1963-65 discussed in Appendix A. Production in 1965 is estimated on the basis of average capacity in 1965 (see Table 1, p. 4, above) multiplied by estimated hours of utilization (see Appendix A). For a discussion of the derivation of the estimate of net trade in 1965, see p. 5, above. Concerning the index of industrial production during 1952-62, see the second footnote on p. 7, above. The index of industrial production shown for 1965 is a projection based on the relationship between increases in consumption of electric power and industrial output during 1952-62 and on the estimated available supply of electric power in 1965.

Table 11

Rumania: Electric Power and Industrial Production a/
1952-62 and 1965

	Electric Power							
				Apparent Consumption			Industrial Production	
Year	Yearend Capacity (Megawatts)	Production (Million Kilowatt-Hours)	Net Trade (Million Kilowatt-Hours)	Million Kilowatt-Hours	Index	Index	Index	Index
1952	873	2,886	-25	2,861	100		100	
1953	945	3,411	-40	3,371	118		107	
1954	1,111	3,697	-40	3,657	128		106	
1955	1,220	4,340	-32	4,308	151		121	
1956	1,334	4,930	-27	4,903	171	100	130	100
1957	1,440	5,440	-14	5,426	190	111	144	111
1958	1,507	6,184	-16	6,168	216	126	163	125
1959	1,604	6,824	-26	6,798	238	139	180	138
1960	1,779	7,650	-28	7,622	266	156	209	161
1961	1,863	8,657	-39	8,618	301	176	242	186
1962	2,099	10,073	-33	10,040	351	205	277	213
1965	2,600	14,000	0	14,000	489	286	395	304

a. Production, capacity, and net trade in 1952-61 are from 40/; in 1962, from 41/. Apparent consumption was derived by adding production and net trade. Capacity in 1965 is capacity at the end of 1962 plus the estimated additions to capacity in 1963-65 discussed in Appendix A. Production in 1965 is estimated on the basis of average capacity in 1965 (see Table 1, p. 4, above) multiplied by estimated hours of utilization (see Appendix A). For a discussion of the derivation of the estimate of net trade in 1965, see p. 5, above. Concerning the index of industrial production during 1952-62, see the second footnote on p. 7, above. The index of industrial production shown for 1965 is a projection based on the relationship between increases in consumption of electric power and industrial output during 1956-62 and on the estimated available supply of electric power in 1965.

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